

# PATENT SPECIFICATION

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## (54) SPECIMEN HOLDER AND ARRANGEMENT FOR REGISTRATION AND READ OUT THEREOF

(71) We, JOHANNES BANCSICH, of Doblinger Hausstrasse 16, A 1190 Vienna, Austria, WOLFGANG HADRIAN, of Hurweidengasse 34/8, A 1190 Vienna, Austria, and ALOIS MARKSTEINER, of Alserbachstrasse 37, A 1090 Vienna, Austria, all Austrian citizens, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a specimen holder, such as a test tube or microscope slide, in particular for utilisation in computerized laboratory operations, which has a data carrier from which there are to be derived the necessary characteristic data for the identification of the specimen.

Specimen holders have to have markings which, for example, serve for their identification, relate to experiments to be carried out and so on. Such markings should be able to be read directly by machine, possibly within the bounds of a computer-monitored laboratory operation. Usually glass or plastic test tubes are used as specimen holders but glass slides may also be employed as specimen holders for mounts to be placed under the microscope.

When using a computer for the determination of chemical and physical measurement results, it is necessary to transfer to the computer not only the actual measured result but also those additional markings serving for more precise identification of the specimen. These markings generally include a specimen number and details regarding the analytical procedure to be carried out.

At present such information is applied either in clear text as labels produced by machine, or manually or by punched holes in the specimen holder itself or in attached punched cards. This information is fed to the computer either manually *via* keyboards, in the case of labels, or by electromechanical means, in the case of punched holes. Within the scope of a computer-monitored laboratory

operation the following requirements are imposed with regard to a specimen identification procedure:

1. The exchange of information between the specimen holder and computer and *vice versa* should take place fully automatically.

2. The information should be easily transferable between different specimen holders. Frequently, different analytical procedures to be used necessitate distribution of the specimen material to different specimen holders. In this case the information has to be transferred to all the specimen holders for the purpose of distinguishing.

3. The information content applied should be capable of being changed as frequently as desired. The erasability and recording of new information is thus particularly necessary for expensive specimen holders (special containers) needing to be reutilisable, for economic reasons.

4. The application, multiplication and reading of information should be capable of being easily carried out technically.

In contrast to the above-described specimen identifications methods conventional at present, in accordance with the invention there is provided a specimen holders which meets all these requirements.

According to the invention there is provided a specimen holder, such as a test tube or slide in particular for utilisation in computerized laboratory operations and having a data carrier which includes magnetisable material and from which there are to be derived the necessary characteristic data for the identification of the specimen, the magnetisable material being in the form of a uniformly distributed layer of magnetic particles, such as magnetic tape, or in the form of separate magnetisable elements, wherein the data carrier is arranged in a shaped part or fitting detachable from the specimen holder and preferably taking the form of a ring, sleeve, push-on part or clamp.

The use of a magnetisable "label" in accordance with the invention is a substan-

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tial and progressive improvement which exhibits considerable advantages such as no spatial separation during the registration and read-out of the identification between "label" and specimen holder, the ability to be re-used as many times as desired, and the recording of additional information during the specimen evaluation.

The data carrier is arranged in a shaped part or fitting, advantageously taking the form of a ring, sleeve, push-on part, or clamp, it being preferable that the specimen holder and/or the shaped part are provided with a physically incorporated identification mark, e.g. a projection, or depression.

Another feature of the invention relates to an arrangement for the registration and read-out of such a specimen holder, which is characterised in that the spaces serving for receiving the specimen holder are made with a configuration corresponding to the shaped parts of the specimen holder and ensuring the correctly positioned insertion of the specimen holder.

In the case of test tubes designed in accordance with the invention, there is fitted on to these, for example, an identification ring made of plastic, in which the magnetisable material is imbedded advantageously in the form of lengths or filaments of steel wire; the accurate positioning of this ring during the reading and recording procedure is effected in the associated apparatus by suitable geometrical shaping.

During the recording-process magnetisation of the magnetic material takes place corresponding to the information to be applied. This information is read non-destructively in the reading instrument, e.g. by means of Hall probes.

As an instance of the application of the magnetic identification process according to the invention its use in a clinical-chemical laboratory is cited. Here it is especially necessary to ensure an unambiguous association between the patient and specimen. This may be effected, for example, by using a patient number. For fully automatic laboratory operation it is also necessary to register on the specimen holder not only the patient number but also the nature of the analytical procedure to be carried out. The specimen holder designed in accordance with the invention is capable of carrying both pieces of information. The result of the analytical procedure may then be fed directly into the computer (on-line) or similarly recorded on the identification ring (off-line) for subsequent evaluation.

A number of embodiments of the specimen holder in accordance with the invention are illustrated in detail by way of example with reference to the drawings in which:

Figure 1 is a side view of a test tube with a data carrier in accordance with the

invention in the form of an identification ring;

Figures 2 and 3 show views from above of two different embodiments of the ring according to Figure 1;

Figure 4 shows a slide with a data carrier in accordance with the invention in the form of a slip-on clamp, and

Figure 5 shows a side view of the slide and slip-on clamp shown in Figure 4.

As evident from Figure 1 a ring 2, made of plastic is pushed on to the top part of a glass test tube 1 and is retained thereon by force-fit, the ring 2 having at its upper end a flange 3 by which it is able to abut against a holder 4.

The sleeve portion of the ring includes a number of lengths of wire 5 distributed over its periphery and disposed axially parallel to the axis of the ring and consisting of magnetisable material, such as steel or iron.

The number of lengths of wire can be selected according to the required number of locations (Bits) and, furthermore, it is possible to provide several locations over the length of the wire, for example, by dividing the wire into several parts each of which corresponds to one bit, and also by arranging the locations in parallel planes, the magnetisable points being, for example, one above the other. In this way it is possible for Bit-words to be formed of any desired size which may be required in practice.

In order that by magnetic means any information to be fed-in or read-out may immediately be imprinted or removed in the correct position of the test tube in the reading or recording apparatus, there is provided as evident in Figures 2 and 3, on the flange 3 of the ring 2 a flat 6 as a depression or a projection 7 either of which may be brought into positive engagement with a corresponding shaped protrusion or depression in the recording or reading apparatus (not shown). In this way there is immediately ensured in each case the correct positioning when being introduced into such an apparatus.

Another embodiment of the design according to the invention in the case of a slide 8 in the form of a glass plate having an oblong rectangular shape and which can be inserted in a microscope, comprises a slip-on U-shaped clamp 9 with extended side pieces 10, advantageously also made of plastic; once again the lengths of wire 5 may be imbedded in the web portion of the clamp 9.

Instead of these lengths of wire, the magnetisable data carrier could comprise a uniformly distributed layer of magnetic particles such as a piece of magnetic tape detachably fastened on the test tube or slide. Of course the specimen holder need not necessarily be a test tube or a slide, but may be a body or vessel of any desired shape which is either connected with the specimen or contains it.

The registering and read-out procedures to be carried out or registering and read-out devices to be used in the case of the specimen holders developed in accordance with the invention are naturally of known type not requiring any detailed explanation.

An appliance used for this purpose in accordance with the invention is advantageously in conformity with such specimen holders enabling correctly positioned insertion into the reading or recording apparatus to be effected and having a corresponding physical configuration providing a position engagement with the holders.

Numerous modifications to the described embodiments are possible within the scope of the invention.

#### WHAT WE CLAIM IS:—

1. A specimen holder, such as a test tube or slide, in particular for utilisation in computerized laboratory operations and having a data carrier, which includes magnetisable material and from which there are to be derived the necessary characteristic data for the identification of the specimen, the magnetisable material being in the form of a uniformly distributed layer of magnetic particles, such as magnetic tape, or in the form of separate magnetisable elements, wherein the data carrier is arranged in a shaped part or fitting detachable from the specimen holder

and preferably taking the form of a ring, sleeve, push-on part or clamp.

2. A specimen holder as claimed in claim 1, wherein the specimen holder and/or the shaped part are provided with a physically incorporated identification mark, for example, a projection or a depression.

3. A specimen holder substantially as herein described with reference to and as illustrated in the accompanying drawings.

4. A specimen identification system including a specimen holder as claimed in claim 1 wherein the magnetisable material is in the form of separate magnetisable elements comprising lengths of wire and an arrangement for the registration and read-out of specimen holders, said arrangement including a holder having spaces serving to receive the specimen holder, which spaces have a configuration corresponding to the shaped parts of the specimen holder to ensure correctly positioned insertion of the specimen holder.

5. A specimen identification system including a plurality of specimen holders as claimed in any one of claims 1 to 3, and a device for registration and read-out data included on said data carriers.

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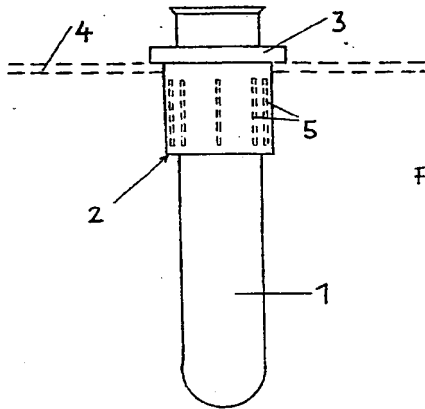


FIG. 1

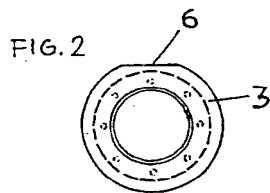


FIG. 2

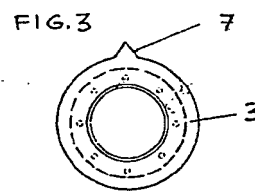


FIG. 3

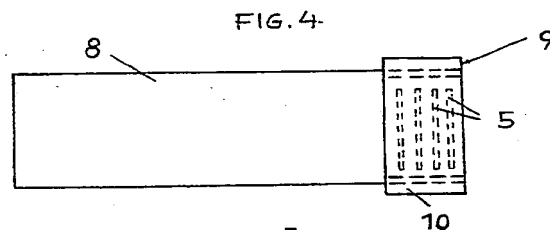


FIG. 4

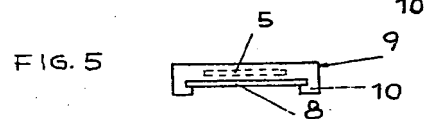


FIG. 5

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